# NOTICE!

## ALL DRAWINGS ARE LOCATED AT THE END OF THE DOCUMENT

TAH-078-99

RF/RMRS-99-455 UN
Revision 0

# Closure Description Document for

# RCRA Closure of Tank and Ancillary Equipment System

# #23 in Building 771

**U.S. Department of Energy**
**Rocky Flats Environmental Technology Site**
**EPA ID No. CO7890010526**

**Reviewed and Approved by:**

T C Baker, Environmental Compliance, RMRS — Date: 11/3/99

**Prepared by:**

N C T Van Tyne, P E , IT Corporation — Date: 11/3/99

(U, Nic)

REVIEWED FOR CLASSIFICATION/UCNI
By [illegible], Classification Analyst
Date 11-4-99

ADMIN RECORD
IA-B771-A-000444

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# 1.0 INTRODUCTION

## 1.1 Purpose and Scope

The Rocky Flats Environmental Technology Site's (RFETS) RCRA Closure Plan for Interim Status Units (Closure Plan) includes the Mixed Residue tank systems and the Idle Equipment tanks in Building 771 Decommissioning and removal of tanks and their ancillary piping and other equipment are subject to the Closure Plan and a subsequent Closure Description Document, which contains a description of the method of closure to be used A two-step strategy will be employed (1) wherever possible, meet the requirements for the "RCRA Stable" condition while the tanks remain in place, and (2) remove the tanks from the building at a later date

The process piping in Building 771 has been divided into thirty-eight discrete "piping systems," with tanks and other ancillary equipment included. Thirty-five of these systems contain process piping connected to RCRA-regulated tanks In order to prepare for building deactivation and to facilitate closure activities, each tank will be isolated by removing the process piping connected to it. Some tanks are connected to more than one process piping system Once a tank has been isolated from **all** process piping systems to which it has been connected, it will be reported in the closure documentation as "RCRA Stable" if the requirements for the "RCRA Stable" condition, as described in the Closure Plan, have been met

This Closure Description Document applies to Tank and Ancillary Equipment System #23 in Building 771, also known as Piping System #23, Fluorinator Scrubber It applies to the closure of the Mixed Residue tanks associated with this system, which are listed in Table 1 in Section 4 0 Closure of the tanks will be accomplished in two separate phases·

a Phase I Removal of the majority of ancillary process piping connected to these tanks and completing the isolation of these tanks and their associated ancillary equipment Tanks meet the basic requirements for the "RCRA Stable" condition by being isolated as well as empty.

b Phase II Completion of RCRA closure of the tanks by removal of each isolated, "RCRA Stable" tank, along with any remaining ancillary piping or isolated ancillary equipment.



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## 1.2 Unit Closure Notification and Schedule

The Colorado Department of Public Health and Environment (CDPHE), Hazardous Materials and Waste Management Division, is hereby notified of the Site's intent to close the tank and ancillary equipment system identified in Section 4 0 The identified closure activities are expected to be completed within 180 days If closure activities cannot be completed within 180 days, a request for extension will be submitted to the Division at least 30 days prior to the end of the 180 days

Phase I activities for all systems are expected to be scheduled during the August 24, 1998 to December 30, 2001 time period Phase II activities will be scheduled through the Rocky Flats Cleanup Agreement (RFCA) annual budget planning and Integrated Sitewide Baseline process

Within 30 days after completion of Phase I or Phase II closure activities, a report will be submitted to CDPHE briefly summarizing the closure activities conducted in accordance with this Closure Description Document The Phase I summary report shall contain the following·

- a declaration that the piping described in the submitted drawings has been removed as planned,
- descriptions of any significant deviations from this Closure Description Document,
- a copy of any newly-generated drawings,
- a statement as to whether the tanks involved have met the requirements of the "RCRA Stable" condition, and
- a summary of relevant analytical results

The summary report for Phase II activities shall contain the following.

- details about the removal of "RCRA Stable" tanks from Building 771; and
- for mixed residue tanks, a statement that the unit is now clean closed



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### 1.3 Facility Contacts

The contacts for closure activities at RFETS are

Assistant Manager
For Environment and Infrastructure
Rocky Flats Field Office
U S Department of Energy
10808 Highway 93, Unit A
Golden, CO 80403-8200
(303) 966-4298

Division Manager
Environmental Systems
and Stewardship
Kaiser-Hill Company, L L C
10808 Highway 93, Unit B
Golden, CO 80403-8200
(303) 966-9876

## 2.0 BUILDING 771 FACILITY DESCRIPTION

According to the *Building 771/774 Closure Project Decommissioning Operations Plan* (DOP) and its references, Building 771 was used for production activities involving plutonium and other actinides in a wide variety of processes between 1951 and 1989 During this time, there was considerable variation in the processes, as well as several upsets that resulted in radiological contamination of the facility

The current scope of decommissioning activities under the DOP includes decontamination, stripout, removal, size reduction and packaging of process and utility equipment, such as gloveboxes, tanks, piping, etc , and demolition of internal non-load-bearing structures as necessary to facilitate these activities

## 3.0 METHOD OF CLOSURE AND PERFORMANCE STANDARD

The tank systems described herein will be closed by the method described as "Unit Removal" in the Closure Plan for Interim Status Units, Section E, while incorporating the intermediate stage of "RCRA Stable," as described in Section F of the Closure Plan All liquids will be drained from these tank systems, to the extent practicable, prior to the start of closure activities

The Phase I performance standard for "RCRA Stable" shall be as follows.

a The tanks are empty, i e , they have been drained to the maximum extent possible using readily available means.
b The piping sections shown in the applicable figures have been removed



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c Inlets to and outlets from the tank, except for the vacuum/vent line, have been isolated and contained, or locked and tagged out

The Phase II performance standard is removal and waste packaging of the tanks and any remaining ancillary equipment

## 4.0 UNIT DESCRIPTION AND WASTE CHARACTERIZATION

The piping for System #23 is located in Rooms 114 and 149, and is associated with the Fluorinator Scrubber. The Fluorinator Scrubber was used in the Hydrofluorination process to neutralize hydrogen fluoride gas with 8M potassium hydroxide The system piping contains spent potassium hydroxide solution with suspended solids Moderate levels of radioactive contamination are currently expected inside the piping

An "Initial Characterization " sheet is included as Attachment 1, with a narrative description in Section K and a description of piping removal scope in Section L Equipment drawings are attached as Figures 1-7 The total length of piping to be removed during Phase I is **estimated** to be 970 feet. In addition to the piping, 33 valves will be removed Forty termination points (TPs) are also indicated in Figures 1-7, and are numbered consecutively. Containment at the TPs will be designed and implemented to protect the room environment from release of contaminants remaining in disconnected systems. Significant changes to Figures 1-7 will be submitted to CDPHE with the Phase I summary report.

During Phase I closure activities, all solution fill, drain and transfer lines indicated in Figures 1-7 will be disconnected and removed from the tanks. The vacuum/vent lines will be left in place during Phase I activities, with the valves in the vent position At the completion of Phase I closure activities, the first four tanks listed in Table 1 are expected to meet the requirements of the "RGRA Stable" condition and this condition will be documented in accordance with the Closure Plan. The remaining tanks will not meet the requirements for the "RCRA Stable" condition with the removal of this system These tanks will be drained and isolated during Phase I activities for System #24, Incinerator Scrubber.

Detailed information about the tanks in System #23 is given in Table 1 on the next page·



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**Table 1: Mixed Residue Tanks in System #23**

| Tank No. | Tank Type | RCRA Unit # | Diameter (ft) | Height (ft) | EPA Codes |
|---|---|---|---|---|---|
| D-705 | Raschig Ring | 93 025 | 3 | 4 7 | D002 |
| D-706 | Raschig Ring | 93 026 | 3 | 4 7 | D002 |
| D-713 | Raschig Ring | 93 027 | 5 | 3 7 | D002 |
| D-714 | Raschig Ring | 93 028 | 5 | 3 7 | D002 |
| D-921 | Raschig Ring | 93 105 | 3 | 5 | D002 |
| D-922 | Raschig Ring | 93 106 | 6 | 5 | D002 |
| D-923 | Raschig Ring | 93 107 | 5 | 6 | N/A |

EPA waste code D002 (corrosivity for caustics) is assigned to the liquids and removable sludges present in all tanks except tank D-923 Tank D-923, although considered a Mixed Residue tank, actually contained only steam condensate. If additional samples of liquids are recovered from piping during the Tap and Drain Project, they will be analyzed and their results will be used to re-characterize the residual liquids in this system Successful removal of liquids and/or sludges from the piping will render it non-hazardous

Because this system contained radioactive liquids with moderate levels of contamination, prevention of release and minimization of work exposure will be addressed in the preparation of the Integrated Work Control Program (IWCP) work package, as described below

## 5.0 SPECIFIC CLOSURE ACTIVITIES

Activities will be designed to achieve the closure performance standard, protect human health and the environment, and minimize waste Specific work instructions, with engineering, health and safety, and waste management information, will be developed prior to the start of identified Phase I or Phase II closure activities These instructions will be developed in accordance with applicable RFETS policies and procedures.

Closure activities are summarized as follows

## 5.1 Establishment of Tank System Boundaries and Scope of Removal for Phase I

The boundaries for System #23, as described in Attachment 1, define the extent of closure activities for this closure description document. The boundaries are at or near flanged joints At TPs where release of contamination and worker exposure are of concern, a relatively short pipe stub (length is dependent on field conditions) which is external to the joint may be used This type of TP will be sealed and therefore contained by two layers of plastic sleeving taped to the stub For tank drain lines, a "U"-shaped section may be left, so that the TP is on a vertical riser

During Phase I closure activities, all overhead piping between the joints nearest the tank outlets and those nearest the points of entry into the gloveboxes will be removed, and the remaining piping capped as described above The tanks themselves and all remaining ancillary piping and equipment (e g , pumps, heat exchangers, actuators) are expected to be removed during Phase II closure activities Tanks D-705, 706, 713 and 714 are currently scheduled for removal as part of D&D Set 6, and tanks D-921, 922 and 923 are scheduled for removal as part of D&D Set 28

System #23 piping located inside gloveboxes will be removed when the glovebox is disassembled, to minimize worker exposure and cost. At that time, the waste will be characterized and managed accordingly.

## 5.2 Preparation of Engineering and IWCP Work Packages (Phases I and II)

A unit-specific IWCP/engineering work package will be prepared for System #23 The RFETS Health and Safety Practices Manual defines the general health and safety measures to be followed at the Site. Closure activities will be conducted in accordance with this manual, incorporating the results of job-specific industrial and nuclear safety-related evaluations and screens.

The IWCP/engineering work package will be used to control work, including preparation of equipment, specification of personal protective equipment, methods of pipe removal and size reduction, methods for containing liquids and preventing releases to the environment, and waste packaging.



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As Low As Reasonably Achievable (ALARA) principles will be followed regarding personnel exposures to radiation Radiological containment will be provided during pipe cutting activities by the use of soft-sided structures such as glovebags, sleeves and/or portable housing Larger containments may be constructed for disassembly and size reduction of tanks and associated equipment Following size reduction, equipment pieces will be inspected and placed into a waste container

Air pressure inside of larger containment will be maintained negative to the room air through the use of a portable air mover or by connection to the building exhaust system Each process room is maintained at negative pressure relative to the surrounding building or outside atmosphere by the building room exhaust system, which prevents the escape of radiological or hazardous substances to the environment. The exhaust from the air mover will pass through a filter, if necessary, to trap particulates

## 5.3 General Methodology for Piping Removal during Phase I

Prior to starting Phase I pipe removal activities, System #23 will be vented, purged, drained and then drained again by tapping into low points, if required, until no additional liquid can be removed The system should then be free of liquids However, it is possible that residual liquids may be encountered during piping removal The removal method employed will include provisions to contain residual liquids and/or sludges, which may contain high levels of radioactive contamination Any resulting liquids or sludges will be characterized and treated for final disposal per waste acceptance criteria.

If a blockage is encountered that cannot be cleared readily during the tap and drain process, additional taps will be installed to minimize the length of the blocked section Blocked sections will be removed with provisions to contain trapped liquids that may be present. These sections will be size reduced in a manner that accommodates the possibility that trapped liquids may be released to containment. A drainage path will be established through any remaining blockages to ensure that all liquid can be drained from the section If significant blockages are encountered during tap and drain activities, piping removal may be conducted in conjunction with those activities

Piping removal, size reduction and packaging activities are considered to be dynamic processes, in which improvements in technology will be implemented as a result of newly available methods or lessons learned from prior piping removal operations. The piping removal steps described



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below may be modified in response to actual operating conditions Possible modifications include the manner in which the pipe sections are separated, the type of containment used as a pipe section is removed, the manner in which vacuum is applied and the type of containment used for size reduction

In the majority of cases, piping will be removed in the following manner

a A glovebag or plastic sleeving will be installed around the section of piping to be removed
b Vacuum will be applied at one or both ends of a pipe section, and removal will proceed toward a vacuum source
c At a TP, the flange will be disconnected or the pipe cut and the remaining pipe stub will be contained by two layers of plastic
d The pipe sections will be separated by the best available method (e g disconnecting at the flanged joint, four-wheel cutter, pipe-crimping tool)
e After the pipe section ends are separated from the rest of the pipeline, the ends of the glovebag/sleeving will be twisted into a "pigtail" formation, from which the ends of the bag can be cut and taped The pipe section can now be removed with taped plastic containment at both ends.
f If any residual liquid or sludge is observed at either end of the removed pipe section, that section will be immediately bagged into the size reduction containment, to be size reduced and inspected The recovered residual liquid and/or sludge will be collected, then stored in an approved RCRA storage area.
g If no residual liquid or sludge is observed at either end of the pipe section, it will be brought to the size reduction area at an appropriate time.
h Piping sections will be size reduced, as necessary, using an approved cutting method Crimped pipe sections must be size reduced
i Pipe sections will be allowed to drain, in a vertical position, as required
j Pipe section ends will be inspected visually to determine whether a blockage is present within the section
k. Blockages in pipe sections will be penetrated by mechanical means to drain any trapped liquid
l Pipe sections will be drained of any remaining liquids or sludges, then placed into waste containers. Residual materials will be sampled and immobilized.

The contents and condition of the interior of the pipe section will dictate its disposition as waste Three typical cases may be encountered

- The interior surface is dry and contains no visible sign of hazardous waste holdup, so that the pipe section can be disposed as non-hazardous waste
- The pipe section contains solid residual material adhering to the interior walls, which cannot be removed readily. The pipe section will be managed as hazardous or non-hazardous waste, after a hazardous waste determination has been made on the basis of the analytical results for a representative sample of the material
- A removable blockage or mobile sludge is found, and is removed from the pipe section and sampled EPA codes are assigned to the sludge based on process knowledge or analytical results, and the sludge is treated to meet applicable waste acceptance criteria The pipe section will be disposed as hazardous or non-hazardous waste, after a hazardous waste determination has been made

Each IWCP work package, which will be prepared prior to the start of closure activities, will include more specific and detailed instructions for the sequence of piping removal steps, removal and size reduction methodology, and removal of residual materials from pipe sections

## 5.4 Preliminary Considerations for Phase II Tank Removal

After the removal of the piping in System #23, all process piping will have been removed from the tanks and they will have been drained of readily removable liquids Additional information about specific features of tank removal will be submitted in an addendum to this CDD.

Removal of the tanks can be described by the following major steps·

a. Containment is placed around the vacuum/vent line, and it is disconnected from the exhaust header
b A decision is made to move the tank to the size reduction facility or to size reduce it in place This decision is based primarily on the size of the tank
c. If the tank is to be size reduced in place, containment is constructed around it in situ Raschig rings and any residual liquid and/or solid material are removed and the interior of the tank is wiped dry.
d If the tank is small enough not to require size reduction in place, it is disassembled from the floor mountings and is brought to the size

reduction facility Raschig ring removal and tank cleaning is conducted in the size reduction facility

e The tank is size reduced, as necessary, and segregated for final waste characterization and packaging

f Characterization of the tank pieces will be driven by analytical results for residual liquids or sludges associated with them.

## 6.0 SAMPLING AND ANALYSIS

Sampling and analytical methods, and quality assurance standards, are addressed in this section

### 6.1 Sampling Methods

Methods used to collect samples are authorized in 6 CCR 1007-3, Part 261, Appendix I, and the Liquid Residue Treatment Waste Characterization Plan for Process Piping Removal. Specific methods will be selected on the basis of ease with which representative samples can be collected, sampling location, sampling matrix, sample container type and size, and accessibility, as well as to maximize the value of data and minimize the number of samples needed

Sampling of liquids is performed using the procedure entitled, Solution Bottle Handling Building 771, PRO-D02-CO-1131 The solution is mixed while in a bottle to assure homogeneity prior to sampling Solid material sampling is performed using the procedure entitled, Laboratory Sampling Procedure, CAS-SOP-003

### 6.2 Analytical Methods and Location

Analytical work will be performed in an RFETS approved laboratory. The analytical test methods for waste characterization are consistent with the approved methods in the Site RCRA Part B Permit, Part VI, Waste Analysis Plan

### 6.3 Quality Assurance

The applicable RFETS Field Operating Procedure, 5-21-000-OPS-FO, or equivalent procedure(s), will be used to ensure the integrity of representative samples and analytical data.



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## 7.0 DISPOSITION OF CLOSURE-RELATED WASTES

Metal, combustible and liquid/sludge wastes may be generated during either Phase I or Phase II closure activities It is assumed that the Site waste management and treatment systems will be available to receive wastes generated by these closure activities

Tank system components and pieces which are radioactively contaminated will be managed in accordance with the requirements of the RFETS Radiological Control Manual and Health and Safety Practices Manual, and will be packaged for disposal in accordance with applicable waste acceptance criteria All metal waste from this system is expected to be either low level waste (LLW) or transuranic waste (TRU), depending on the amount of actinide present, and will be characterized in accordance with applicable regulations Tank system components and pieces completely free of any holdup will be managed as non-hazardous waste because there were no listed wastes in this system, and their materials of construction do not exhibit any characteristics of a hazardous waste. If the metal waste is determined to be hazardous debris, then an approved extraction technology may be implemented; however, hazardous debris is not expected for System #23

Wipes and other combustible materials that are used to clean surfaces or to immobilize free liquids will be placed into waste drums, characterized and managed in accordance with applicable regulations Other combustible wastes, including PPE and plastic containment void of any hazardous constituents, will be managed as non-hazardous radioactive waste All waste drums will also be analyzed by non-destructive assay to categorize them as LLW or TRU and they will be stored in an appropriate onsite storage area prior to offsite disposal

The only liquids expected to be generated during Phase I or Phase II closure activities are the residual liquid holdup in the equipment. Liquid inventory in the tanks or ancillary equipment, except for incidental amounts that may be absorbed onto wipes, will be drained into 4-liter bottles until analytical results are available These liquids will be analyzed for the presence of fluorides, although only trace levels are expected The bottles would be placed into permitted or otherwise compliant storage areas and managed in accordance with applicable regulations The contents of the bottles may be transferred to process waste tank D-545 (for caustics), depending on analytical results. Liquids in bottles destined for the Miscellaneous Cementation treatment process or the Caustic Waste Treatment process will be sampled and analyzed for final characterization prior to transfer

Any liquid or mobile sludge found in components during closure activities will be removed or immobilized in situ prior to packaging for disposal, in accordance



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with applicable waste acceptance criteria Sampling of the sludge may be necessary to characterize it properly. System components containing solidified sludge that adheres to the interior walls will be characterized using analytical results for a representative sample of the sludge and managed in accordance with applicable regulations The sampling protocol and number of sampling locations will be determined if solid residual material actually is encountered, and will be based on the Waste Characterization Plan

## 8.0 SOIL CONTAMINATION EVALUATION AND POST CLOSURE CARE

The operating history for these tank systems (e g , building logs, RCRA inspection logs and occurrence reports) indicates that there have been no spills or releases to the environment as a result of waste management activities in these units Phase I and Phase II closure activities associated with these tank systems are not expected to impact the soils surrounding Building 771. Therefore, soil contamination will be evaluated as part of decommissioning and cleanup activities for the Building 771 complex under RFCA, and post-closure care activities are not necessary as part of the closure of these tank systems

## 9.0 RECORDKEEPING

The following closure records will be maintained onsite during closure activities, and at a federal repository for a minimum of 30 years following the report of closure

- sampling logs, including type, numbers and date of samples,
- analytical results,
- records of actions taken to decontaminate equipment and/or structures;
- work instructions used to conduct closure activities,
- closure report for Phase I activities, and
- documentation verifying that closure activities were conducted in accordance with the approved Closure Plan and with this Closure Description Document, following completion of Phase II activities

## 10.0 AMENDMENT OF THE CLOSURE DESCRIPTION DOCUMENT

In conducting Phase I or Phase II closure activities, unexpected events that are identified during the implementation of closure activities may require an amendment to this Closure Description Document. Modifications to this Closure Description Document will be made in accordance with applicable regulations

During the planning and development stage of Phase II closure activities, additional drawings that are developed for the removal of tanks and remaining ancillary equipment will be submitted as an addendum to this Closure Description Document This Closure Description Document may be augmented or superceded by an approved Building 771 Decommissioning Operations Plan (DOP)

## 11.0 REFERENCES

1 Code of Colorado Regulations, Vol 6, No 1007-3, Part 265, Subpart G, Sections 265 110 through 265 120
2 Rocky Flats Environmental Technology Site RCRA Permit, Part X Closure Plan, effective 5/10/98
3 Rocky Flats Environmental Technology Site Closure Plan for Interim Status Units, effective 7/98
4 Rocky Flats Environmental Technology Site 1997 Hazardous Waste Tank Systems Management Plan, effective 2/13/98.
5 Backlog Waste Reassessment Baseline Book, an RFETS Level 1 Manual, effective 2/17/98
6 Building 771 Basis for Operation (BFO), 98-RF-00947, effective 2/27/98
7 Building 771 Liquids Process Piping Removal Waste Characterization Plan, Rev 0, 12/3/98



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## Attachment 1: Initial Characterization for System #23

BUILDING 771TAP & DRAIN/PROCESS PIPING REMOVAL CHARACTERIZATION SHEET

| SYSTEM NUMBER | NAME | ENGINEER | REVISION DATE |
|---|---|---|---|
| 23 | FLUORINATOR SCRUBBER | STEPHANIE YELA | 08/27/99 |

| | |
|---|---|
| A START POINT | Room 114, Line 6 and Tank D-7 |
| B END POINT | Room 114, Tank D-714<br>Room 149, Tank D-921 |
| C. CHEMICAL COMPOSITION | 8M KOH, HF |
| D RAD/ACTINIDE CONTAMINATION | $>10^3$ g/l Pu/U and <6 g/l Pu/U |
| E. ESTIMATED SYSTEM MAX VOLUME | 4 Liters |
| F. TANKS INVOLVED | D-705, 706, 713, 714, 921, 922, and 923 (Raschig Ring Tanks) |
| G GLOVEBOXES INVOLVED | Room 114, Line 1 (South) and Line 6<br>Room 149, Line 31 |
| H. OTHER COMPONENTS | Line 1, Slop Pot and three ful-flo filters<br><br>Line 6, Mist Eliminator H-Scrubber, caustic circulation pump and two banks of two ful-flo filters each, and a floor pick-up ful-flo filter |
| I SYSTEM INTERFACES | System 24 - Incinerator Scrubber<br>System 26 - Fume Scrubber<br>System 29 - 8M Potassium Hydroxide<br>System 35 - B771/774 Caustic Waste Line<br>System 37 - House Vacuum |
| J. CHEMICAL COMPATIBILITY AT INTERFACE(S) | 8M KOH, HF |
| K. NARRATIVE DESCRIPTION | The Fluorinator Scrubber supported the Hydrofluorination operation in Room 114 HF gasses were swept by vacuum and air purge from Line 7 into the Line 6 caustic H-Scrubber, where the off gasses were neutralized with caustic (8M potassium hydroxide)<br><br>The scrubber level was automatically controlled while metering fresh caustic into the scrubber with the spent caustic being transferred to Tank D-705<br><br>NOTE All references to Line 1 are Line 1 South<br><br>The caustic in Tank D-705 was filtered through Line 1 into Tank D-706<br><br>A sample was taken of the contents in Tank D-706 If the solution was below the Economic Discard Level (EDL), the contents were transferred to Tank D-714, resampled, and if confirmed to be below the EDL, shipped to Building 774, Waste Operations |

REVIEWED FOR CLASSIFICATION U/NU
BY D.D. Smith
DATE 8-27-99

K NARRATIVE DESCRIPTION (continued)

Piping from Valve HV-1625, the drain of Tank D-705, the dead leg, and Valve HV-1606 to the inlet of the pump

Piping from the outlet of the pump to Valve HV-1638 inside Line 1

Piping from the fill of Tank D-705 and Valve HV-1602 to the "T" at Valve HV-1638 (inside Line 1)

Piping from the fill of Tanks D-713 and D-706 to Valve HV-1638 inside Line 1

Piping from Valve HV-1606 to Valves HV-1648 and HV-1649 (inside Line 1)

Subsystem 5 (Sketch 5)

Piping from Valve HV-93 (at flowmeter cabinet) to the scrubber

Piping from Valve HV-1662 to the ful-flo filter (Valve HV-4046)

Piping from Valve HV-1661 (at the heat exchanger) and Valve HV-4047 (inside Line 6) to the outlet of the pump

Piping from Valves HV-1661, AOV-1500, and AOV-1501, through the heat exchanger, to Valve HV-1680 (inside Line 6)

Piping from Valve HV-1680 (inside Line 6) and the top of the scrubber to Valve HV-4045

Piping from Valve AOV-1500 to the lower ful-flo filter (inside Line 6)

Piping from Valve AOV-1501 to the lower ful-flo filter (inside Line 6)

Piping from Valves HV-1658, HV-1660, and AOV-4591B, through Valve AOV-4591A, to the lower ful-flo filter (inside Line 6) including Valve HV-1683

Piping from Valve AOV-4591B to the lower ful-flo filter (inside Line 6) including Valve HV-1685

If the contents of either Tank D-706 or D-714 were above the EDL, the contents of the tank were transferred to Tank D-713 for filtration until below EDL

The piping has a cross-tie between Tanks D-705/706 fill and Tank D-922 fill to allow filtration in Line 50 in the event of a backup of solution

Although Line 6 had its own vacuum system (Line 7A), it will not be used to transfer solution The vacuum pump, vacuum traps, and associated piping will not be drained and removed as part of this evolution but will be addressed in System 37, House Vacuum. An approved, alternate vacuum source will be used to remove solution for this evolution

Tanks D-921, D922, and D-923 are excluded from this system and will be addressed in System 24 - Incinerator Scrubber



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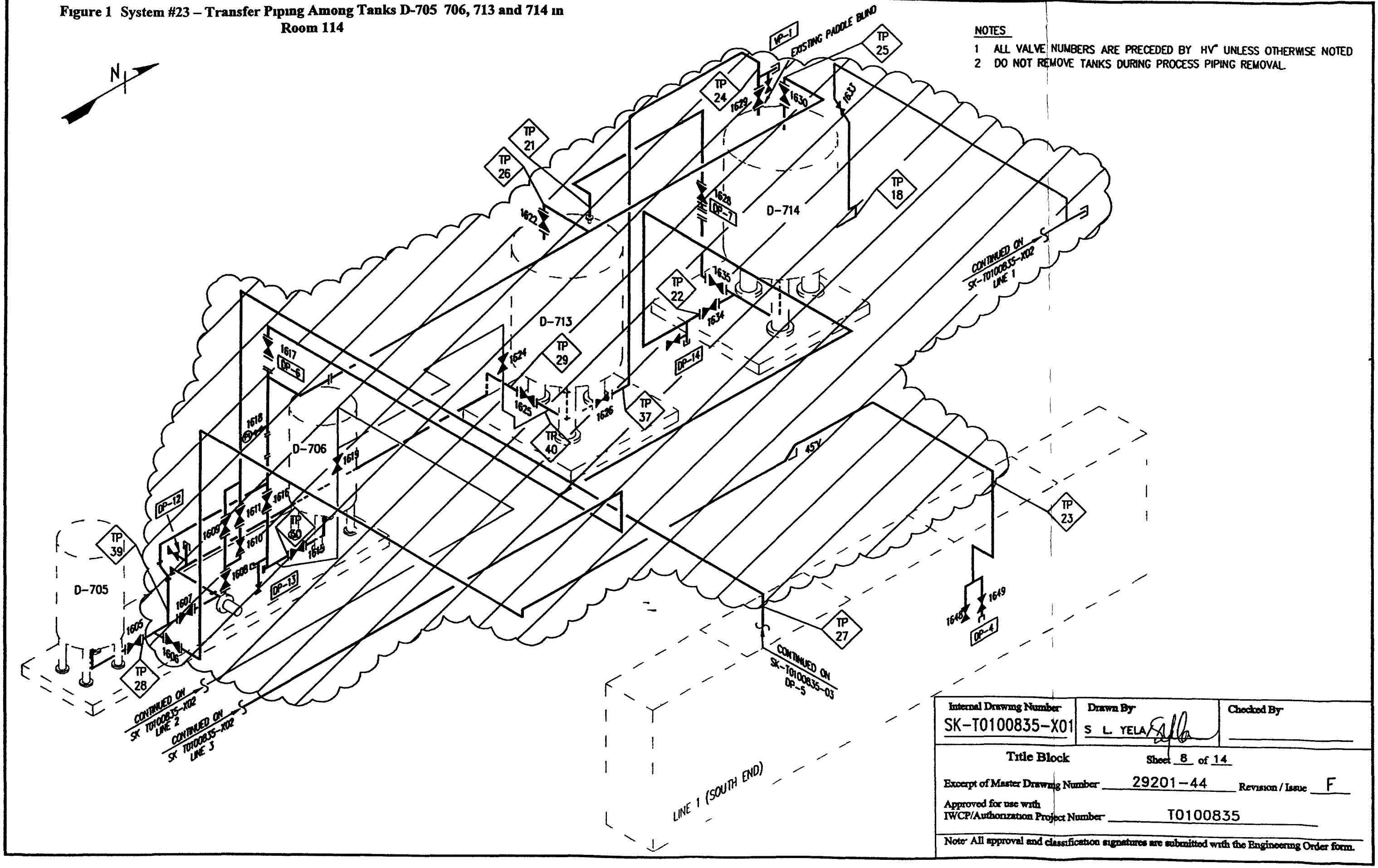
## Attachment 1, cont.: Initial Characterization for System #23

| | |
|---|---|
| **K NARRATIVE DESCRIPTION (continued)** | Piping beyond Valve HV-1771 is excluded from this system and is expected to have been removed in System 26 - Fume Scrubber<br><br>Piping for the 8M KOH is excluded from this system and will be addressed in System 29 - 8M Potassium Hydroxide<br><br>Building 774 caustic waste piping is excluded from this system and will be addressed in System 35 - B771/774 Caustic Waste Line<br><br>Solutions may be drained by gravity or may be vacuum-assisted<br><br>It may not be possible to drain all piping/tubing inside gloveboxes Remaining residual liquids will be drained during the D&D process<br><br>There is approximately 970 linear feet of primarily 1-inch diameter stainless steel piping associated with this system |
| **L PIPING REMOVAL DESCRIPTION** | Piping may be removed in the same order as listed in the narrative, with the understanding that the EWP process may change the sequence of steps Piping removal techniques will be discussed with the pipefitters, with emphasis on the difficulty in removing pipe in the overhead<br><br>Craft knowledge gained from the removal of piping in other systems should be applied to the removal of this piping |

**Figure 1 System #23 – Transfer Piping Among Tanks D-705 706, 713 and 714 in Room 114**




| Internal Drawing Number | Drawn By | Checked By |
|---|---|---|
| SK-T0100835-X01 | S L. YELA | |

Title Block Sheet 8 of 14

Excerpt of Master Drawing Number 29201-44 Revision / Issue F

Approved for use with IWCP/Authorization Project Number T0100835

Note: All approval and classification signatures are submitted with the Engineering Order form.



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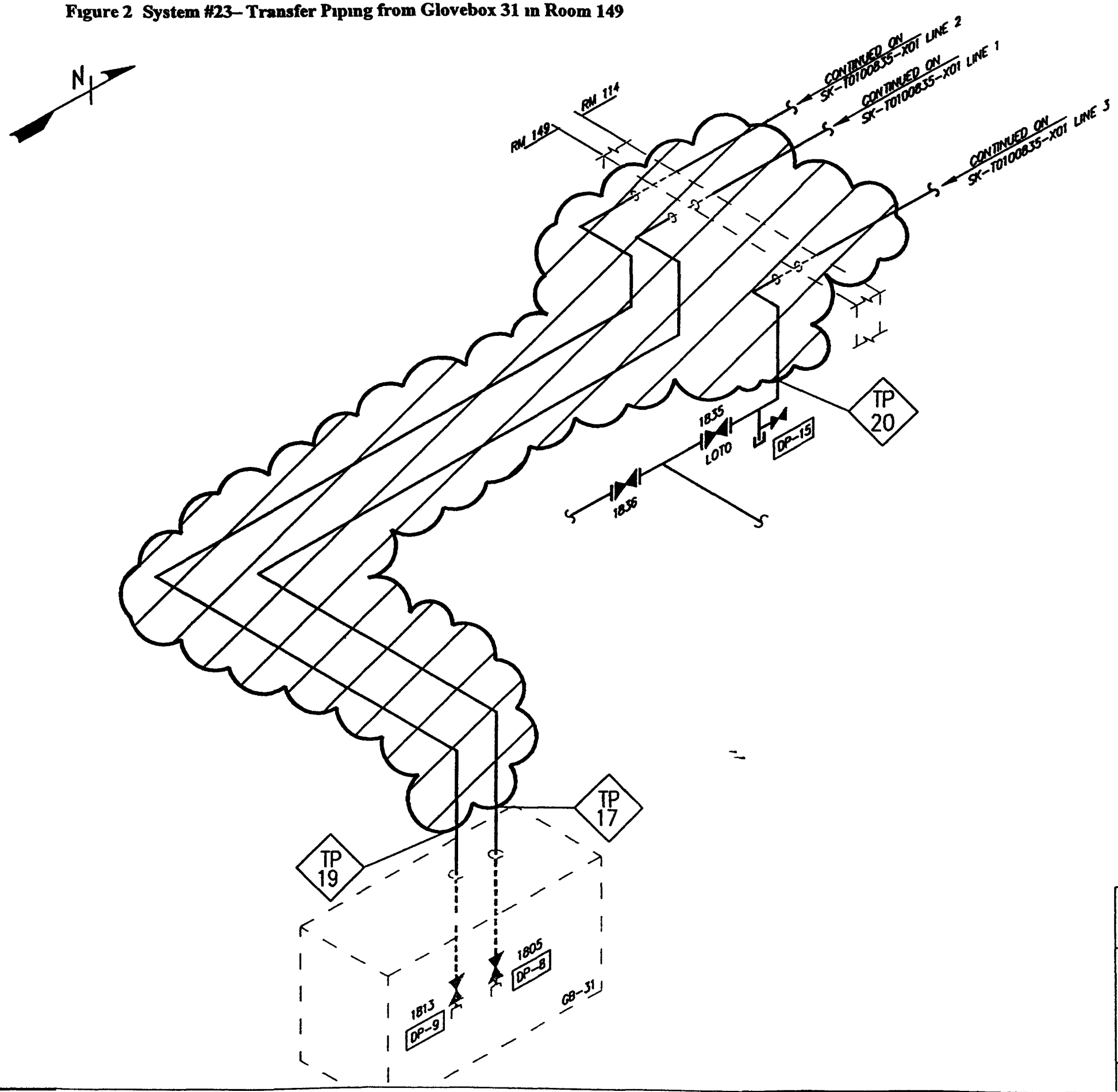
**Figure 2 System #23– Transfer Piping from Glovebox 31 in Room 149**




NOTES:

1 ALL VALVES ARE PRECEDED BY "HV" UNLESS OTHERWISE NOTED

| Internal Drawing Number | Drawn By | Checked By |
|---|---|---|
| SK-T0100835-X02 | S L YELA | |

Title Block

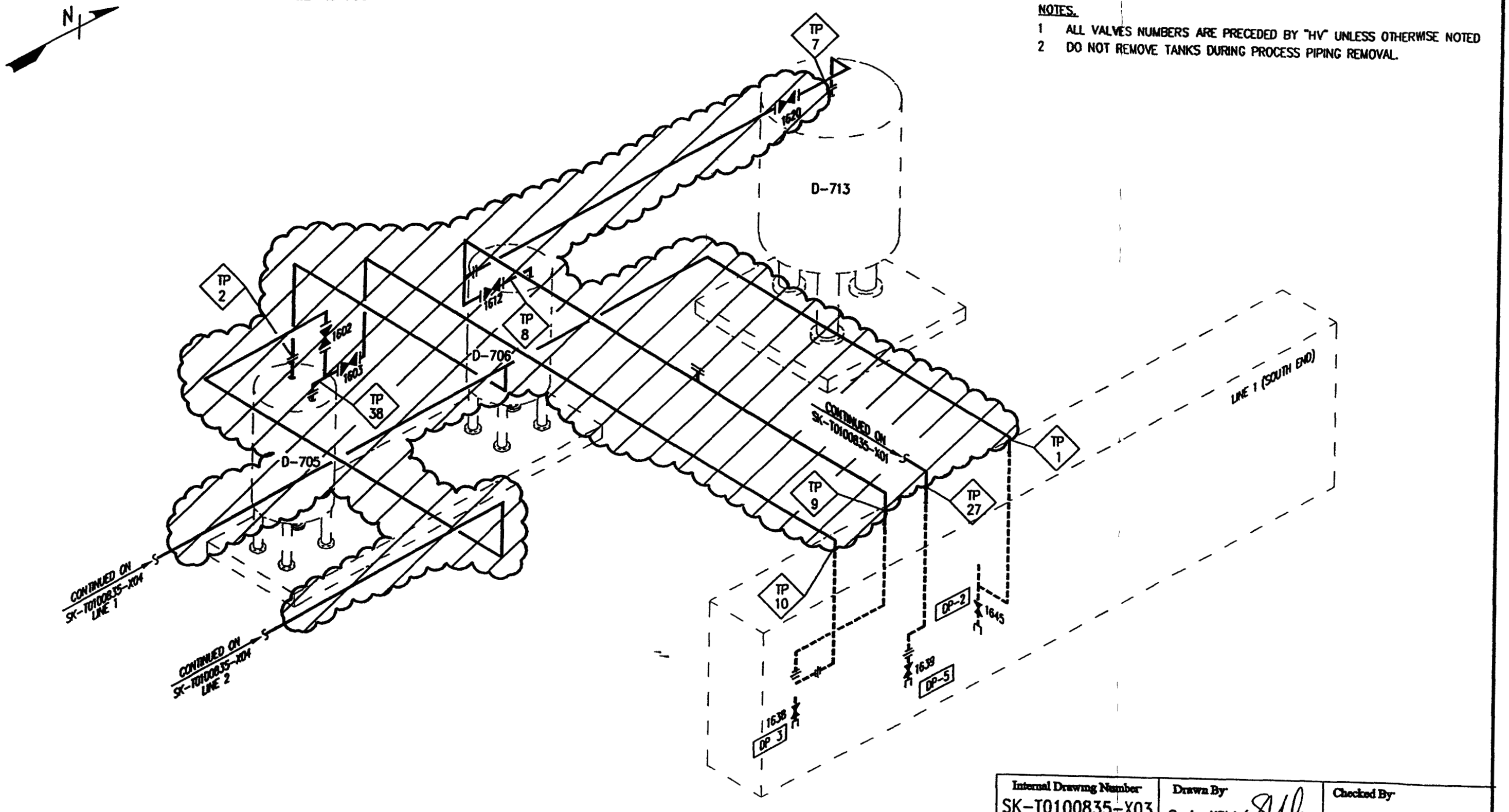
Sheet 9 of 14

Excerpt of Master Drawing Number 29201-44 Revision / Issue F

Approved for use with IWCP/Authorization Project Number T0100835

Note: All approval and classification signatures are submitted with the Engineering Order form.

**Figure 3 System #23 – Additional Transfer Piping Among Line 1 and Tanks D 705 and D 706**




| Internal Drawing Number | Drawn By | Checked By |
|---|---|---|
| SK-T0100835-X03 | S L YELA/ | |

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Excerpt of Master Drawing Number 29201-44 Revision / Issue F

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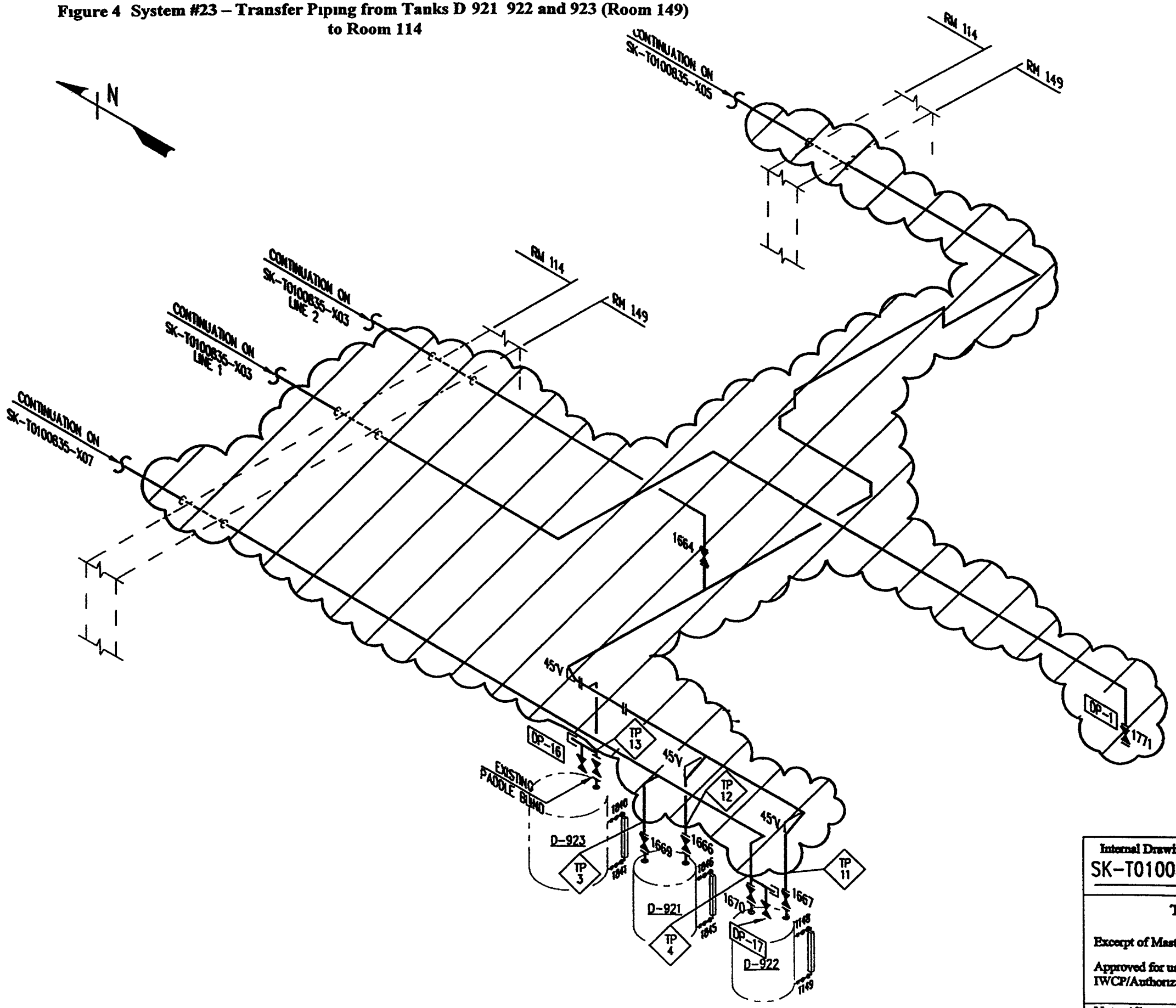
**Figure 4 System #23 – Transfer Piping from Tanks D 921 922 and 923 (Room 149) to Room 114**




| Internal Drawing Number | Drawn By | Checked By |
|---|---|---|
| SK-T0100835-X04 | S L. YELA | |

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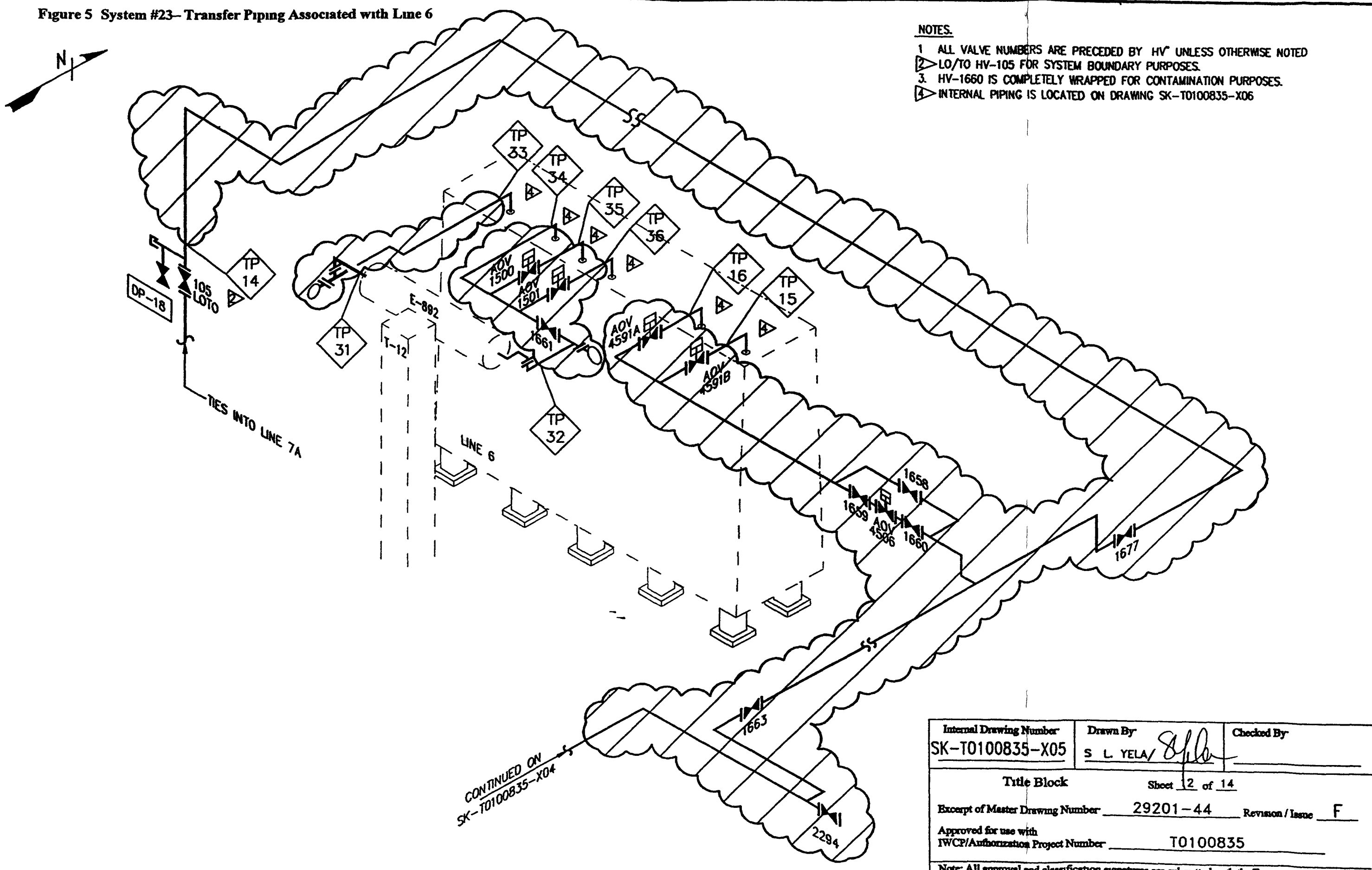
**Figure 5 System #23– Transfer Piping Associated with Line 6**




| Internal Drawing Number | Drawn By | Checked By |
|---|---|---|
| SK-T0100835-X05 | S L. YELA/ | |

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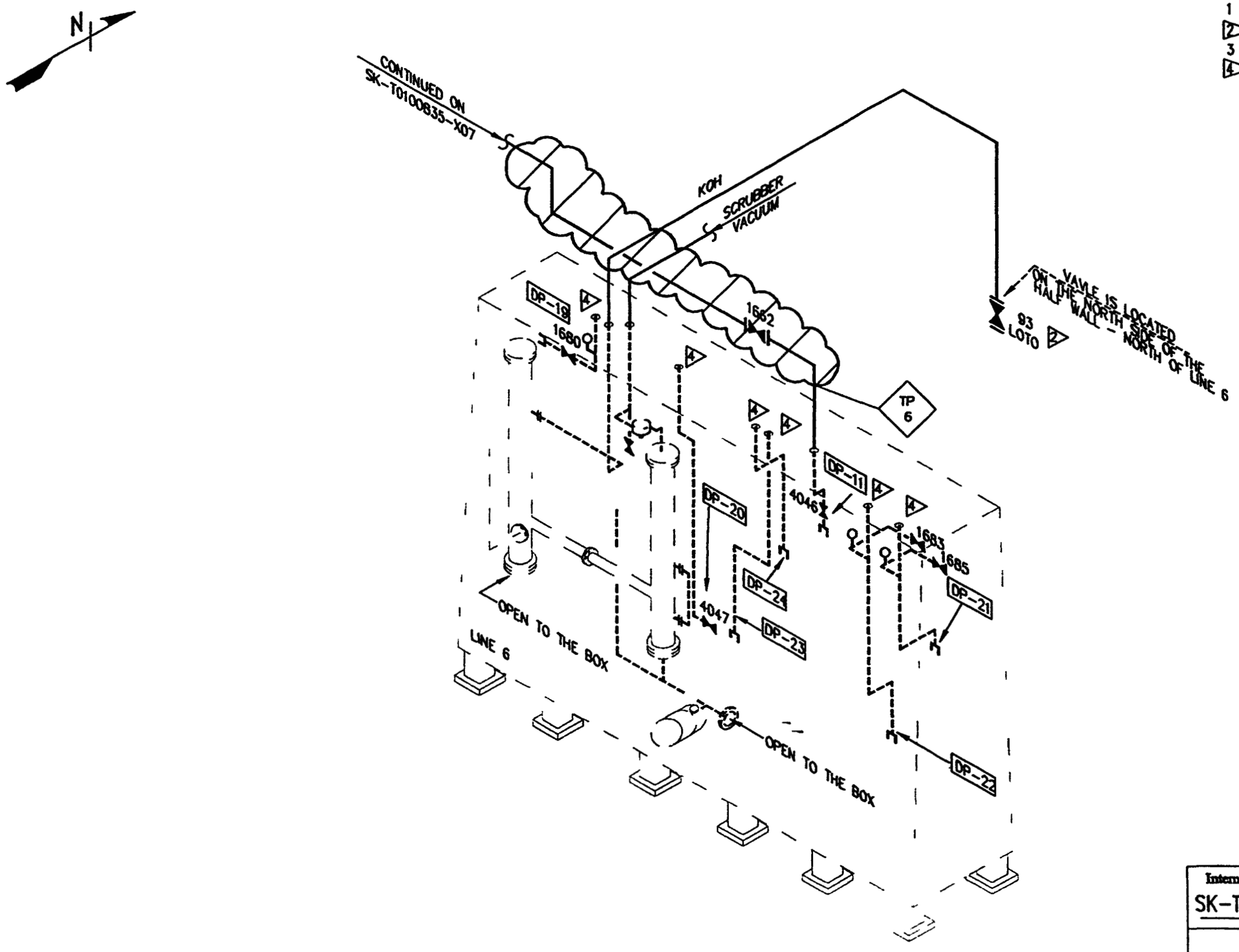
**Figure 6 System #23 – Spent Caustic Waste Line from Line 6**




NOTES.

1 ALL VALVE NUMBERS ARE PRECEDED BY HV" UNLESS OTHERWISE NOTED
2 LO/TO HV-93 IN THE SHUT POSITION FOR SYSTEM BOUNDARY PURPOSES.
3 HV-1660 IS COMPLETELY WRAPPED FOR CONTAMINATION PURPOSES
4 EXTERNAL PIPING IS LOCATED ON DRAWING SK-T0100835-X05

| Internal Drawing Number | Drawn By | Checked By |
|---|---|---|
| SK-T0100835-X06 | S L. YELA/ | |

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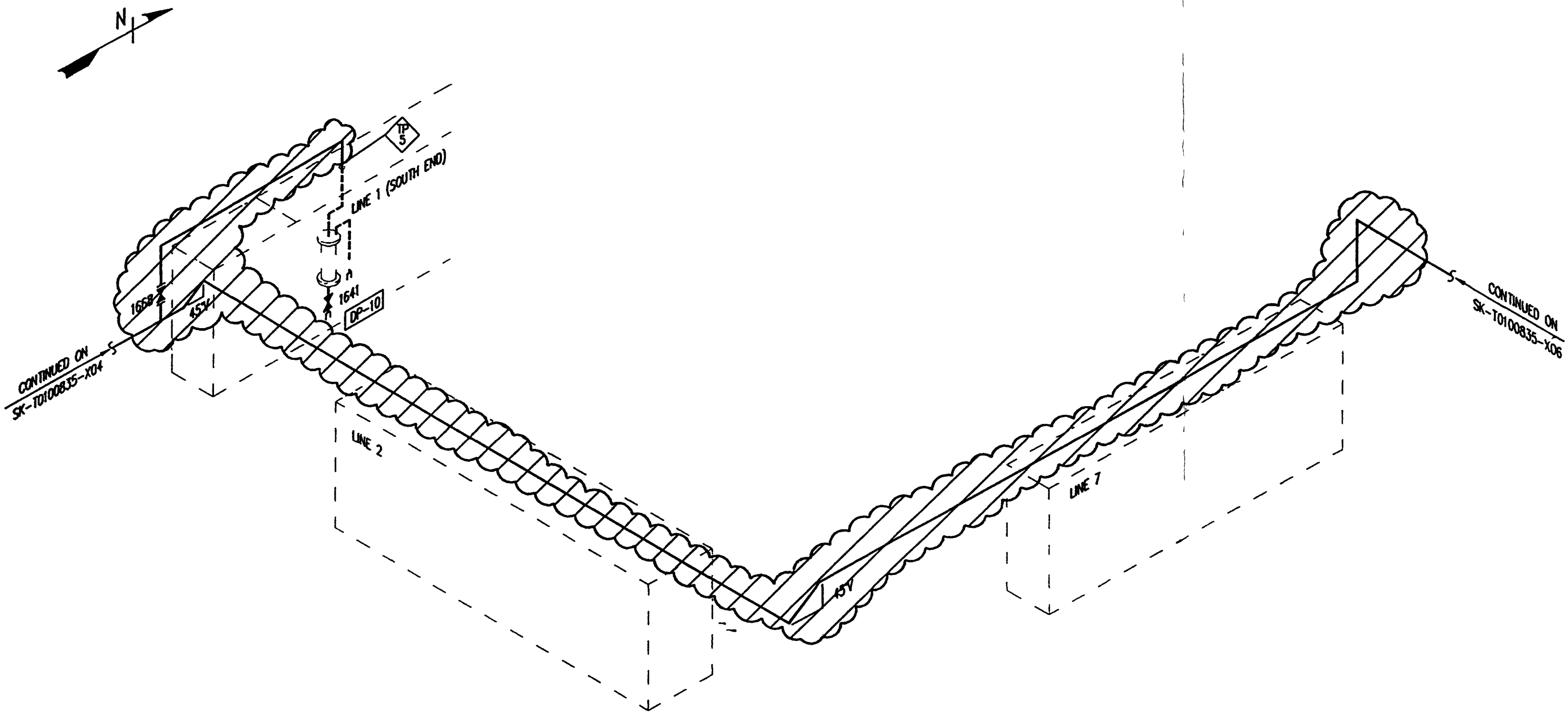
Note: All approval and classification signatures are submitted with the Engineering Order form.

**Figure 7 System #23 – Spent Caustic Waste Line from Room 149**




NOTES

1 ALL VALVE NUMBERS ARE PRECEDED BY "HV" UNLESS OTHERWISE NOTED

| Internal Drawing Number | Drawn By | Checked By |
|---|---|---|
| SK-T0100835-X07 | S L. YELA | |

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Note All approval and classification signatures are submitted with the Engineering Order form.



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